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URAL LIGNITE DEPOSITS WORKED BY OPEN-PIT METHOD

THE KORKINO DEPOSIT

M. M. Sokolovskiy

The Korkino lignite deposit, in the section where open-pit mining is done, is a complicated anticlinal fold with the dip of the seams ranging from gentle to steep, and with a short strike. The deposit contains 13 coal seams of which seam II, ranging in thickness from 30 to 200 meters, is chiefly worked by the open-pit method. In the northwest section of the deposit, seam II is divided by thick rocky layers into two divisions, Upper II and Lower II.

In the floor of seam II there is a thick belt of low-grade coal and sheared carboniferous rocks with very slight contacts between layers. The hanging rock of the deposit is made up predominantly of argillite, siltstone, and sandstone. The bedrock is covered by a layer of clayey rock overburden up to 15 meters thick.

Open-pit mining was started in the Korkino deposit in 1934 and at present two large coal pits, No 1 and 2, are in operation. The deeper of these, No 2, has reached a depth of 160 meters for coal and 70 meters for removal of overburden.

Coal is removed by one-bucket excavators with a bucket capacity of 0.5-2.5 cubic meters and is transported to the surface by RT-60 belt conveyers.

The overburden benches are worked by heavy USSR-made, 3-cubic-meter, SE-3 excavators which load the rock into standard-gauge railroad transport. Until recently, series E steam locomotives and Kaliningrad plant motor dump cars were the chief equipment for moving overburden to the banks. However, since the volume and depth of overburden removal have increased, the slopes for railroad tracks became steeper and steam traction has begun to be replaced by electric traction. The total length of railroads for removing overburden from the pits is 100 kilometers.

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When the original plans for Korkino pits No 1 and No 2 were drawn up, it was planned to work the deposit only 80 meters from the surface. The measures adopted and decisions made were short-range and did not take into consideration 25-30 years' operations of the pits. To ensure the utmost efficiency of operations of the pits, their depth must be increased far more than has yet been done. This will require reconstruction of the pits' industrial installations, and a radical revision of a number of technological procedures, such as methods of overburden removal, mining, and transportation. The Uralshakhtoproyekt Trust, which for a number of years has had charge of planning the Korkine pits, is paying little attention to this serious problem.

The best plan submitted so far was advanced by two mining engineers, Shukhov and Puzyrev, but even this had defects. The Uralshakhtoproyekt Trust must see to it that an adequate plan for reconstructing the coal pits is completed and put into effect in the shortest possible time, without decreasing the coal output.

The Korkino coal pits are at present an extremely important open-pit mining enterprise and, after their reconstruction, will not be equaled.

THE BOGOSLOVSKIY DEPOSIT

G. P. Yegurnov, Ye. B. Stakhevich

The Bogoslovskiy lignite deposit, worked by the Vakhrushevugol' Trust in the Urals, consists of a coal seam ranging in thickness from 8-38 meters and averaging 28 meters. The surrounding rock is made up chiefly of argillite, siltstone, and sandstone. The deposit represents a brachiosynclinal fold with a gentle slope on the west side (7-15 degrees), and a steep one on the east (45-80 degrees).

The deposit is opened up by three trenches, the Northern, the Southern, and the Lapchinskaya, and is being worked by the open-pit method in four pits, No 2, 1, 3, and 5, located from north to south. Pits No 2, 1, and 3 have a common front.

Methods of working the Bogoslovskiy deposit are at present faulty and, as a result, the technical and economic indexes of work here are lower than they should be in a deposit so suited for open-pit mining as the Bogoslovskiy deposit. For example, with the geological removal coefficient 2.6 at the Bogoslovskiy deposit and 3.0 at the Raychikhinsk deposit, 1949 labor productivity was 15 percent higher at the Raychikhinsk pits and production costs, per ton of coal, were 15 percent lower than in pits of the Vakhrushevugol' Trust. Coal losses in coal pits of the Vakhrushevugol' Trust amounted to 10.7 percent in 1948 and 9 percent in 1949 as a result of the inadequate method of working the lower bench and the poor system of coal removal from the seam.

The efficiency of mining in the Vakhrushevugol' Trust pits could be stepped up by a revision in mining methods along three lines: (1) revision and regulation of lower bench removal by the nontransport method; (2) revision of the system of working the coal seam; (3) alteration in the system of transporting coal from the mine face to the loading points.

Several combinations of machines are suggested for working the lower bench: an SE-3 power shovel with an unloading radius of 12.8 meters and an ESH-1 dragline which is able to work a bench up to 16 meters high; an EGL-15 power shovel with a capacity of 15 cubic meters used with ESH-10 and ESH-1 draglines (the power shovel has a yearly capacity of 4 million cubic meters

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and the dragline, 2.5 million cubic meters) an EGL-15 power shovel and an ESh-14 dragline which has a capacity of 14 cubic meters per scoop and a yearly capacity of 3 million cubic meters; and an EGL-10 power shovel and an ESh-10 dragline.

Efficient use of the nontransport method in the coal pits of the Vakhrushevugol' Trust could sharply improve its technical and economic indexes. A large increase in nontransport removal work (up to 60 percent of entire volume of rock work), a considerable decrease in re-excavation work, backfilling the worked-out area with up to 25 percent of the material removed from the lower bench, generally without reshoveling; lowering the coal losses; introduction of an effective and simple method of transporting coal with the aid of motor dump trucks; considerable simplification in the loading economy; and regulation of coal-cleaning procedures, all these things, preliminary estimates show, will increase labor productivity 100-200 percent and reduce the production costs of coal to approximately half of its present figure in Vakhrushevugol' Trust coal pits.

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